

render it patent. Some of the bad results seen in many of the other clinics may be attributed to operators who attempt to do the standard type of mastoidectomy in these critically ill patients.

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### Diphtheria

**Synthetic Diphtheria Antitoxin.**—Under the stimulus of the newer concepts of immunology<sup>1</sup> several recent attempts have been made to prepare artificial specific antitoxins. A very suggestive result has recently been reported by Sdrawosmisslow and Kostromin of the Bacteriological Institute, Perm, Russia.<sup>2</sup> These workers incubated diphtheria toxin with a large excess of trypsin, and obtained a nontoxic toxin "trypsinate" which, in their hands, was apparently identical with true diphtheria antitoxin.

Although Kimmelstiel of the Hygienic Institute, Breslau, Germany<sup>3</sup> has recently questioned this conclusion, offering an alternate explanation of their observed antitoxic effects, she does not question their claim that their "trypsinate" has distinct antitoxic properties.

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### REFERENCES

1. The Newer Knowledge of Bacteriology and Immunology, University of Chicago Press, Chap. 81, p. 1078.
2. Ztschr. f. Immunitätsforsch u. exper. Therap., Vol. liv, p. 1, 1927-28.
3. Ibid., Vol. lxii, p. 245, 1929.

### Medicine

#### PART II\*

**The Present Status of Liver Function Tests.** It is a very different story with the excretion tests of liver function. Here we have at our command at least three reasonably simple tests of which we can expect definite information in regard to suspected liver injury in individual cases. In the first place, there is the quantitative estimation of serum bilirubin by means of Bernheim's icterus index,<sup>1</sup> or the more complicated quantitative van den Bergh. Then we have the quantitative urine urobilogen test, the simplest of the three, if the Wallace-Diamond technique be used.<sup>2</sup> Finally, one can use one of the dye excretion tests of which the Rose-Bengal<sup>3</sup> test is preferable to others. Below is given a brief discussion on what tests to select and what to expect of them in the more common liver conditions.

1. In *catarrhal jaundice* the icterus index and the dye excretion tests are practically parallel in their reports on the degree of liver injury and the same is true of the urine urobilinogen except that at the height of the disease there is almost

no urobilogen found probably due to almost complete obstruction of the bile passages. Since these liver function tests have taught us that in catarrhal jaundice the amount of liver damage is parallel to the depth of jaundice, there is for all practical purposes no necessity of doing them in ordinary cases of this disease.

2. In *obstructive jaundice* of any type the depth of color is a satisfactory measure of the amount of liver damage just as in catarrhal jaundice. In addition, here it is often valuable to know, from the standpoint of diagnosis and prognosis, the exact degree of jaundice and especially its trend to increase or decrease. In this respect the icterus index is much more accurate than the eye. In complete biliary obstruction urobilogen disappears from the urine altogether.

3. In *arsenical jaundice* all three tests are positive and about equally reliable. No arsenicals should be given till the return of function to normal, as shown by one or more of these tests.

4. *Carcinoma of the liver* and bile ducts with obstruction belongs in the class of obstructive jaundice. In carcinoma of the liver without obstruction, dye excretion seems to be impaired most often (in about 70 per cent of cases in one series), an increased icterus index is a close second (in about 60 per cent) and increase in urobilogen comes third with positive results in only 40 per cent of cases. The explanation for such poor results is that carcinoma involves the liver only in spots, leaving much healthy liver tissue for compensation of function. From this it can be said that in suspected cases of carcinoma of the liver only positive results are of value.

5. *Cirrhosis of the liver*, whether of the portal or biliary type, always shows a reduction of dye excretion, the extent of which is a reliable guide to the degree of liver damage. This fact is of special importance since the icterus index only shows the presence or absence of latent jaundice in portal cirrhosis and the degree of jaundice in biliary cirrhosis, while the increase in urobilogen is by no means a constant factor in cirrhosis as well as in other chronic liver conditions. The dye test is of special value in differential diagnosis of portal cirrhosis in the presence of ascites because dye excretion is normal in cardiac failure, tuberculous peritonitis, and carcinomatosis of the peritoneum. On the other hand, urobilogen is often increased in chronic passive congestion of the viscera.

6. In *severe infections of the liver* both the dye retention and increase in urine urobilogen are marked and express the degree of liver involvement, while the increase in the icterus index may be slight.

7. Finally, in *diseases of the hematopoietic system* like hemolytic jaundice, pernicious anemia, polycythemia, leukemia, and Gaucher's disease, dye elimination is normal. In Banti's disease dye retention indicates the presence of cirrhosis of the liver. The icterus index in these conditions serves merely as an index of hemolysis and urine

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urobilogen is usually increased in cases of excessive blood destruction.

Before closing I would like to say that I do not share the opinion often expressed that liver function tests compare unfavorably with kidney function tests. If we take as an example the dye excretion tests, the two most frequent criticisms are: First, that it does not express the impairment of all functions of the liver, and, second, that when the test is positive there are already other signs of liver disease present. But precisely the same is true of the phthalein test for kidney function: While the retention of the dye roughly corresponds to that of nitrogenous products in the blood, it gives us no idea in regard to water or salt retention. Also one usually does not do the phthalein test unless there are some clinical indications of kidney damage and, I might say, unless another excretion test of the kidney, namely, a urine analysis, has shown some abnormalities.

The conclusion from this review of liver function tests is that, by judicious selection of one or more from the three discussed excretion tests, it is possible in most cases to confirm a suspicion of liver damage when it is present and to gain some conception of its extent.

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2. Wallace, J. B., and Diamond, J. S.: The Significance of Urobilinogen in the Urine as a Test for Liver Function, Arch. Int. Med., 35:698, June 1925.
3. Epstein, N. N., Delprat, J. D., and Kerr, W. J.: The Rose-Bengal Test for Liver Function, J. A. M. A., 88:1619, May 21, 1927.

#### Allergy

**Acute Articular Rheumatism an Allergic Manifestation.**—Swift has recently suggested that acute articular rheumatism is a manifestation of allergy. It has long been known that there is a relationship between tonsillitis and the joint infection. With the allergic conception this seems satisfactorily explained.

When the primary infection is in the tonsils, the streptococci and the protein derived from them gain access to the blood stream; and, in the same manner as in tuberculosis, the body cells are rendered sensitive to streptococci and their products.

There are certain tissues which streptococci are prone to infect, among which are the heart valves and joint structures. These localizations are probably selective, the same as the tonsils are the location of choice in the primary streptococcus infection and in diphtheria; and Peyer's patches in typhoid fever.

Streptococci may escape from the tonsillar infection and circulate in the blood in small quantities, the same as tubercle bacilli, without producing illness. But let them become implanted in a joint or in the heart valves and an immediate reaction occurs, differing according to the nature

of the tissues in the two situations. In both instances the cells have been sensitized by the circulating streptococcus protein. In the former the allergic reaction shows as a predominantly exudative process which later may become predominantly proliferative or may disappear by absorption of the exudate. Large quantities of serum may be poured out in the joint just as large effusions occur in the pleura when it is the seat of an allergic reaction in tuberculosis. In the heart valve, on the other hand, the tissues are dense and the reaction, while inflammatory, shows a preponderance of proliferation and a minimum of exudation. The after course of the infection will depend on its severity and upon whether or not the allergic reaction is kept up for a period of time by further quantities of streptococci and streptococcal products gaining access to the blood stream and coming in contact with the joint or valvular tissues. Where the tonsils are furnishing the source of repeated reinoculations, immediate tonsillectomy should relieve the exacerbations, unless further reinoculation is caused by the trauma of the operation. Owing to the fact that there is great danger of reinoculations following tonsillectomy during acute inflammation, it is a very questionable procedure, however, and should be done only after most careful consideration. If no new exacerbations are taking place, the removal of the tonsils can await recovery of the joint.

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Medical History Course at University of California School of Medicine.—The University of California Medical School will inaugurate a new course in the field of medical history and bibliography with the opening of instruction for the spring semester on Tuesday, January 14, according to an announcement just made by Dr. Langley Porter, dean of the school.

In order to provide instruction in these subjects two appointments to the faculty have been made. Dr. LeRoy Crummer of Omaha, Nebraska, has accepted appointment as clinical professor of medical history and bibliography, beginning this month, and Dr. Sanford Larkey has been appointed assistant professor of medical history and bibliography, effective July 1, 1930.

Doctor Crummer visited California in January, 1929, to give a series of lectures on old medical books and medical history. To illustrate his lectures he brought with him part of his own collection of rare books which is one of the best in the country. The portion that he brought with him was valued at \$96,000.—*University of California Clip Sheet*.

#### The Surgeon's Hands

His face, I know not whether it be fair  
Or lined and grayed to mark the slipping years,  
His eyes, I do not glimpse the pity there.  
Or try to probe their depths for hopes or fears.  
Only upon his wondrous hands I gaze.  
And search my memory through so fittingly  
To voice their loveliness, in still amaze  
I bow before their quiet dignity.  
They make the crooked straight and heal old sores,  
The blind to see, the war-torn clean and whole.  
Throughout the suffering world they touch the doors  
That open wide to life, the bitter bowl  
Of pain they sweeten till the weary rest,  
As though the hands of Christ had served and blest."

—*Ida Norton Munsen*.